



Caltrans Division of Research,  
Innovation and System Information

# Research Results

Pavement

**NOVEMBER 2013**

**Project Title:**

Extended Applications of  
Rehabilitation Construction Productivity  
Analysis Products (CA4PRS)

**Task Number:** 1886

**Start Date:** May 4, 2009

**Completion Date:** October 31, 2011

**Product Category:** Improved software,  
business practice, decision support  
tool, model, and simulation

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## CA4PRS Software Improves Rehab Pavement Projects

*Training workshops get engineers familiar with the CA4PRS management and analysis tool for designing cost-effective pavement rehab strategies*

### WHAT WAS THE NEED?

The CA4PRS (Construction Analysis for Pavement Rehabilitation Strategies) tool helps designers and engineers plan and estimate the schedule and cost of pavement rehabilitation or reconstruction projects. Users can review various combinations of design, construction, and traffic management considerations to develop an effective strategy to minimize disruption and costs. The software's scheduling module estimates highway project duration, incorporating alternative strategies for pavement designs, lane-closure tactics, and contractor logistics. The traffic module quantifies the impact of construction work zone closures on the traveling public in terms of road user cost and time spent in queue.

CA4PRS was developed by the University of California Pavement Research Center (UCPRC) in 2002 through a Federal Highway Administration pooled-fund, multistate consortium. Many successful case studies have demonstrated the software's capabilities and benefits, stimulating ongoing requests to add analysis functions and provide technical support and training on practical implementation. The pooled-fund study was able to cover the functional enhancements, while this project focused on developing training and resources on how to use CA4PRS to implement actual highway projects.

### WHAT WAS OUR GOAL?

The goal was to provide Caltrans district engineers and planners with training and technical support to use CA4PRS software to design and plan actual highway projects.

*The CA4PRS software improves planning rehab projects, reducing the time needed for road closures.*



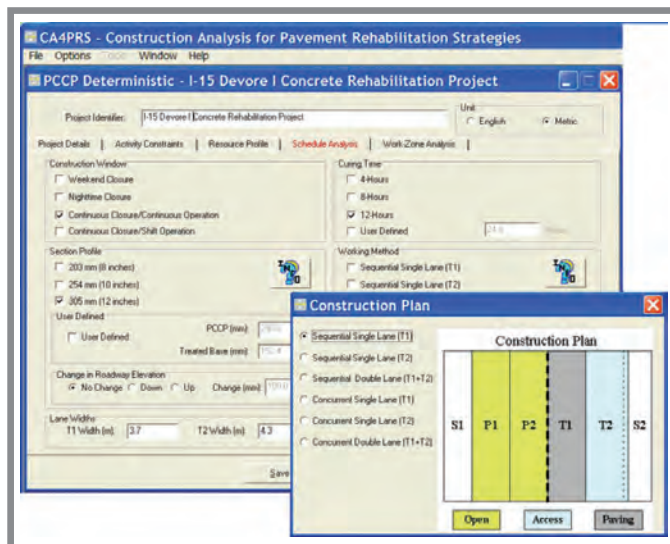
DRISI provides solutions and knowledge that improve California's transportation system.

## WHAT DID WE DO?

The research team delivered hands-on training and workshops to Caltrans district engineers and planners. Project-specific workshops assisted staff in using the various software functions, including analysis to develop initiation documents and establish the most effective design choices for their highway rehabilitation projects.

Some of the rehab projects that used the software tool were:

- US-101 Ukiah (District 1) concrete pavement slab replacement
- I-5 Sacramento (District 3) asphalt pavement rehab
- I-5 Redding (District 3) concrete pavement rehab
- I-80 Sacramento (District 3) concrete pavement rehab
- SR-99 Elk Grove (District 3) asphalt pavement rehab
- I-5 Colusa (District 3) asphalt pavement rehab
- I-680 Walnut Creek (District 4) pre-cast concrete slab replacement, crack-and-seat overlay
- I-15 Riverside (District 8) concrete pavement rehab
- I-5 Stockton (District 10) continuously reinforced concrete pavement rehab



CA4PRS user interface

## WHAT WAS THE OUTCOME?

The results demonstrated that using CA4PRS supports Caltrans' goal to efficiently deliver quality transportation projects and to maximize transportation system performance. CA4PRS enables users to analyze project schedules, costs, and potential traffic delays faster and more effectively than traditional methods. Some of the benefits that the engineers gained from learning how to use CA4PRS include:

- Reduced the time required to develop the design, construction schedule, and traffic management options
- Improved construction staging and more effective traffic management plans
- Lessened work zone-related vehicle delays in urban locations with high passenger volumes and on rural roadways carrying heavy freight

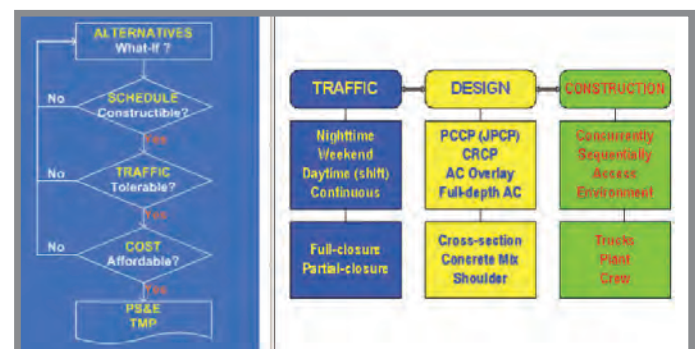
## WHAT IS THE BENEFIT?

Highway rehabilitation projects often cause congestion, safety problems, and limited access for road users. It is also challenging to find economical ways to repair deteriorating roadways in metropolitan areas while keeping the traveling public as safe as possible and minimizing disruptions for local communities and surrounding businesses. CA4PRS speeds up pre-construction analysis, enabling engineers to compare more alternatives in a shorter time and find the most effective solutions for a transportation project with confidence. CA4PRS minimizes inconvenience and maximizes affordability.

## LEARN MORE

For information about the development and uses of CA4PRS:

[www.dot.ca.gov/research/roadway/ca4prs/index.htm](http://www.dot.ca.gov/research/roadway/ca4prs/index.htm)



CA4PRS compares rehab alternatives as what-if scenarios based on various parameters in terms of traffic, design, and cost.